AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A sol-gel coating material ~~comprising a~~ prepared by mixing ~~product of~~ together

(A) an acrylate copolymer solution comprising a reaction product of:

a1) at least one (meth)acrylic ester,

a2) at least one ethylenically unsaturated monomer that carries at least one hydroxyl group per molecule, and

a3) at least one ethylenically unsaturated monomer that carries per molecule at least one acid group that can be converted into a corresponding acid anion group;

(B) a stock coating material comprising a hydrolysis and condensation product of at least one hydrolysable silane of the general formula I

$$SiR_4 \qquad (I)$$

wherein:

R = hydrolysable groups, hydroxyl groups, and nonhydrolyzable groups with the proviso that there is at least one hydrolysable group present; and

(C) a sol comprising a hydrolysis, condensation, and complexing product of the at least one hydrolysable silane of the general formula I and at least one hydrolyzable metal compound of the general formula II

$$MR_n \qquad (II)$$

wherein:

R = hydrolysable groups, hydroxyl groups, and nonhydrolyzable groups with the proviso that there is at least one hydrolysable group present, and

n = 3 or 4.

2. (Previously Presented) The sol-gel coating material of claim 1 wherein the sol-gel coating material is aromatics free.

3. (Previously Presented) The sol-gel coating material of claim 1, wherein the sol-gel coating material comprises, based on its total amount, 5 to 40% of the acrylate copolymer solution, 5 to 40% of the stock coating material, and 1 to 15% of the sol.

4. (Previously Presented) The sol-gel coating material of claim 1, wherein the sol-gel coating material has a solids contents of the acrylate copolymer solution (A), the stock coating material (B), and the sol (C) in a weight ratio of (A):(B):(C) of (0.5 to 5):(1 to 10):(1).

5. (Previously Presented) The sol-gel coating material of claim 1, wherein:
the nonhydrolyzable groups R are at least one of an alkyl group; an alkenyl group; alkynyl group; and an aryl group; and
the hydrolyzable groups R are at least one of a hydrogen atom; an alkoxy group; an alkoxy-substituted alkoxy group with 3 to 20 carbon atoms; an acyloxy groups; and an alkylcarbonyl group.

6. (Previously Presented) The sol-gel coating material of claim 5, wherein
the hydrolyzable groups R are at least one of a methoxy group, an ethoxy group, a n-propoxy group, an i-propoxy group, a n-butoxy group, a sec-butoxy group, a beta-methoxyethoxy group, an acetoxy group, a propionyloxy group, and an acetyl group; and

the nonhydrolyzable groups R are at least one of a methyl group, an ethyl group, a propyl group, a butyl group, a vinyl group, a 1-propenyl group, a 2-propenyl group, a butenyl group, an acetylenyl group, a propargyl group, phenyl, and naphthyl.

7. (Previously Presented) The sol-gel coating material of claim 1, wherein the nonhydrolyzable group R contains at least one functional group.

8. (Previously Presented) The sol-gel coating material of claim 1, wherein the sol is complexed by organic compounds that form chelate ligands.

9. (Previously Presented) The sol-gel coating material of claim 1, wherein the sol-gel coating material is a sol-gel clearcoat material.

10. (Previously Presented) A method comprising applying the sol-gel coating material of claim 1 to a substrate to produce a mar-resistant sol-gel coating.

11. (Previously Presented) The method of claim 10, wherein the mar-resistant sol-gel coating is a cured at least one coat paint system.

12. (Previously Presented) The method of claim 10, wherein the mar-resistant sol-gel coating is one of an automotive OEM coating, an automotive refinish coating, an industrial coating, a container coating, a plastic coating, and a furniture coating.

13. (Previously Presented) A process comprising

(i) applying at least one coat of a paint system to a primed or unprimed substrate,

(ii) applying the sol-gel coating material of claim 1 atop the paint system, and

(iii) curing the sol-gel coating material.

Claims 14-16 (Canceled)

17. (Previously Presented) A sol-gel coating comprising the sol-gel coating material of claim 1.

18. (Previously Presented) A substrate comprising at least one sol-gel coating of claim 17.

19. (Previously Presented) The sol-gel coating material of claim 7, wherein the at least one functional group is at least one of an epoxide group, an amino group, an olefinically unsaturated group, a mercapto group, an isocyanate group, and a reaction product of any of the preceding with further reactive compounds.

20. (Previously Presented) The sol-gel coating material of claim 1, wherein at least two of:

a. the sol-gel coating material is aromatics free;

b. the sol-gel coating material comprises, based on its total amount, 5 to 40% of the acrylate copolymer solution, 5 to 40% of the stock coating material, and 1 to 15% of the sol;

c. the sol-gel coating material has a solids contents of the acrylate copolymer solution (A), the stock coating material (B), and the sol (C) in a weight ratio of (A):(B):(C) of (0.5 to 5):(1 to 10):(1);

d. the nonhydrolyzable groups R are at least one of an alkyl group; an alkenyl group; alkynyl group; and an aryl group; and the hydrolyzable groups R are at least one of a hydrogen atom; an alkoxy group; an alkoxy-substituted alkoxy group with 3 to 20 carbon atoms; an acyloxy groups; and an alkylcarbonyl group;

e. the nonhydrolyzable group R contains at least one functional group;

f. the sol is complexed by organic compounds that form chelate ligands; and

g. the sol-gel coating material is a sol-gel clearcoat material.

21. (Previously Presented) The sol-gel coating material of claim 20, wherein at least one of:

a. the nonhydrolyzable groups R are at least one of an alkyl group; an alkenyl group; alkynyl group; and an aryl group; and the hydrolyzable groups R are at least one of a hydrogen atom; an alkoxy group; an alkoxy-substituted alkoxy group with 3 to 20 carbon atoms; an acyloxy groups; and an alkylcarbonyl group; and

b. the at least one functional group is at least one of an epoxide group, an amino group, an olefinically unsaturated group, a mercapto group, an isocyanate group, and a reaction product of any of the preceding with further reactive compounds.

22. (Previously Presented) A sol-gel coating comprising the sol-gel coating material of claim 20.

23. (Previously Presented) A substrate comprising at least one sol-gel coating of claim 22.

24. (Previously Presented) A method comprising applying the sol-gel coating material of claim 20 to a substrate.

25. (Previously Presented) The method of claim 13, wherein at least one of:

a. the sol-gel coating material is aromatics free;

b. the sol-gel coating material comprises, based on its total amount, 5 to 40% of the acrylate copolymer solution, 5 to 40% of the stock coating material, and 1 to 15% of the sol;

c. the sol-gel coating material has a solids contents of the acrylate copolymer solution (A), the stock coating material (B), and the sol (C) in a weight ratio of (A):(B):(C) of (0.5 to 5):(1 to 10):(1);

d. the nonhydrolyzable groups R are at least one of an alkyl group; an alkenyl group; alkynyl group; and an aryl group; and the hydrolyzable groups R are at least one of a hydrogen atom; an alkoxy group; an alkoxy-substituted alkoxy group with 3 to 20 carbon atoms; an acyloxy groups; and an alkylcarbonyl group;

e. the nonhydrolyzable group R contains at least one functional group;

f. the sol is complexed by organic compounds that form chelate ligands;

g. the sol-gel coating material is a sol-gel clearcoat material;

h. the applied sol-gel coating material is cured by irradiation with intermediate IR radiation;

i. the at least one coat paint system has been completely cured; and

j. the at least one coat paint system is one of an automotive OEM coating, an automotive refinish coating, an industrial coating, a container coating, a plastic coating, and a furniture coating.

26. (Previously Presented) The method of claim 25, wherein at least one of:

a. the nonhydrolyzable groups R are at least one of an alkyl group; an alkenyl group; alkynyl group; and an aryl group; and the hydrolyzable groups R are at least one of a hydrogen atom; an alkoxy group; an alkoxy-substituted alkoxy group with 3 to 20 carbon atoms; an acyloxy groups; and an alkylcarbonyl group; and

b. the at least one functional group is at least one of an epoxide group, an amino group, an olefinically unsaturated group, a mercapto group, an isocyanate group, and a reaction product of any of the preceding with further reactive compounds.

27. (Previously Presented) A sol-gel coating material produced by the process of claim 13.

28. (Previously Presented) A substrate comprising at least one sol-gel coating of claim 27.

29. (Previously Presented) A sol-gel coating material produced by the process of claim 25.

30. (Previously Presented) A substrate comprising at least one sol-gel coating of claim 29.

31. (Previously Presented) A sol-gel coating material produced by the process of claim 26.

32. (Previously Presented) A substrate comprising at least one sol-gel coating of claim 31.